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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,611	03/17/2004	Rekapalli Krishnamohan Rao	026033-00030	4185
4372	7590	11/08/2007		
ARENT FOX LLP 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036			EXAMINER OLSEN, KAJ K	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 11/08/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/801,611	RAO ET AL.	
	Examiner	Art Unit	
	Kaj K. Olsen	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The specification needs to open with a statement stating this application is a continuation of PCT IB03/06195 filed on 12/26/2003.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 9, 11, and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. In claim 9, there is no antecedent basis for "the gas cylinders". It appears that claim 9 should depend from claim 8.

4. In claim 11, there is no antecedent basis for "the calibrated gas cylinders". It appears that claim 11 should depend from claim 7.

5. Claim 15 fails to further limit claim 1 because it consist entirely of an optional limitation. Because claim 15 doesn't require a database access system be actually provided, it doesn't further limit claim 1 when such a system is not being provided.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, 6, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al (USP 6,120,664) in view of Bannister et al (USP 4,193,857), Croset et al (USP 4,364,226), and Mallebrein et al (USP 5,255,554).

8. Claims 1-4, 6, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al (USP 6,120,664) in view of Bannister et al (USP 4,193,857), Croset et al (USP 4,364,226), and Mallebrein et al (USP 5,255,554).

9. Patel discloses a system for characterization and calibration of gas sensors comprising a furnace 28 attached to a gas selection mechanism 44 where the furnace is provided with the gas sensor 32 to be characterized and a temperature sensor 34. See fig. 4 and 6 and col. 5, ll. 1-57. Because Patel discloses that the gas selection mechanism is for delivering calibration gas (col. 6, ll. 38-45), it inherently constitutes a predetermined quantity of gas to be detected. Patel further discloses that the signals for the gas sensor and temperature sensor are sent to a signal conditioning electronics with the eventual output going to a display unit. See col. 5, l. 66 through col. 6, l. 15. Patel does not explicitly recite the use of a furnace that is a muffle furnace. However, Bannister teaches that muffle furnaces find utility in the gas sensing art for testing the sensor components. See col. 8, ll. 35-38. Because muffle furnaces are already conventional in the art, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Bannister for the system of Patel to achieve the predictable result of providing a suitable heating mechanism for the sensor. Patel also

does not explicitly recite the use of a micro converter through a buffer and offset amplifier mechanism. However, it is conventional in the art to buffer and offset a sensor output before sending a sensor signal to a micro converter. In particular, the use of a buffer mechanism is demonstrated by Croset where a sensor output is placed through a module 9 in order to match the impedance to the eventual sensor circuitry. See col. 5, ll. 35-52. With respect to the use of offset amplifiers, Mallebrein teaches that Nernst voltage signals from oxygen sensors (like those of Patel) need to have an offset applied such that the voltages from the oxygen sensor match the input range for the analog-to-digital converter (ADC) (i.e. sensor signals can have negative voltages but ADCs operate with voltages above 0V). See col. 1, ll. 20-41, col. 2, ll. 32-50 and col. 3, l. 63 through col. 4, l. 7. The ADC of Mallebrein would also read on the defined micro converter of the claims and would prepare the analog sensor signal into digital signal appropriate for computer control. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the buffer mechanism of Croset and the offset mechanism of Mallebrein for the system of Patel and Bannister to ensure the sensor signal is both impedance matched to the sensor circuitry and that the voltage are matched to an effective input range of any downstream micro converters (e.g ADCs).

10. With respect to the furnace maintaining a predetermined value, see Patel, col. 6, ll. 29-33.

11. With respect to the use of an oxygen or lambda sensors, see col. 6, ll. 16-28.
Lambda sensors are Nernst sensors.

12. With respect to the predetermined gas being oxygen, because Patel is an oxygen sensor (col. 6, ll. 16-28), oxygen is the obvious choice of calibration gas.

13. With respect to the micro converter converting the sensor and temperature signals to digital values, Mallebrein already set forth the use of an ADC for converting the sensor signal. With respect to also converting the temperature measurement, because Patel already teaches measuring the temperature and evidences that the sensor signal is temperature dependent (see col. 5, l. 66 through col. 6, l. 28), it would have been obvious to also utilize the micro converter to also convert the analog temperature measurements (i.e. a thermocouple voltage) into computer readable (i.e. digital) signals.

14. With respect to the presence of a database access system, this limitation is optional and doesn't further define claim 1 (see 112 rejection above).

15. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel in view of Bannister, Croset, and Mallebrein as applied to claim 1 above, and further in view of applicant's admitted prior art.

16. The references set forth all the limitations of the claim, but did not explicitly recite the use of a Bosch sensor. However, applicant admitted in the background of the invention that Bosch already had a specially made sensor for combustion systems. See p. 2, ll. 28 and 29 of the specification. Because Patel does not establish any criticality concerning the particulars of the make or model of the oxygen sensor utilized for its analyzer, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the known sensor from Bosch for the system of Patel in view of Bannister, Croset, and Mallebrein to achieve the predictable result of providing a suitable measure of oxygen content of the analyzed gas.

17. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel in view of Bannister, Croset, and Mallebrein as applied to claims 1 and 6 above, and further in view of Hayashi et al (USP 4,046,158).

18. The references set forth all the limitations of the claims, but did not explicitly set forth the presence of a plurality of gas cylinders containing a predetermined quantity of calibration gas. Hayashi teaches that it is old in the art to perform gas calibrations utilizing a plurality of different gases concentrations from a plurality of different gas cylinders so as to be able to generate a calibration curve for a given gas analysis. See col. 1, ll. 4-13. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize a plurality of different concentrations of calibration gas derived from a plurality of different gas cylinders as taught by Hayashi for the system of Patel, Bannister, Croset, and Mallebrein so that the sensor performance can be checked over a wider range of gas concentrations. With respect to the presence of a control mechanism for controlling the amount of air being supplied, Hayashi also teaches the presence of valves 9 and regulators 8 for controlling the gas being supplied.

19. With respect to the presence of 6 cylinders having the specified gas concentrations, finding the desired number and range of cylinders for affecting the desired calibration requires only routine skill in the art. In particular, because an oxygen sensor will see anywhere from 0% (oxygen concentration in a rich atmosphere) to 21% (atmospheric oxygen concentration) with the sensor seeing lower than atmospheric concentrations while monitoring combustion products (i.e. the oxygen would be consumed), the use of 0, 2, 4, 6, 8, and 10% oxygen would have been obvious choices of concentrations to choose.

20. With respect to the use of solenoid valves, actuators for the solenoids, or rotameters, these are both conventional devices found on gas lines and the use of these would have only required routine skill in the art.

21. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel in view of Bannister, Croset, and Mallebrein as applied to claim 1 above, and further in view of Cain et al (USP 6,492,601).

22. The references set forth all the limitations of the claims, but did not explicitly recite the use of an AduC812 microconverter. Cain teaches that such a micro converter was already known in the art for sensor operations. See col. 5, ll. 50-59. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Cain for the system of Patel, Bannister, Croset, and Mallebrein because the substitution of one known micro converter for another requires only routine skill in the art.

23. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patel in view of Bannister, Croset, Mallebrein as applied to claim 1 above, and further in view of Jackson (USP 4,307,601).

24. The references set forth all the limitations of the claims, but did not explicitly recite the use of a 7-segment LED display. Jackson teaches in an alternate calibration device that 7-segment LED displays 136 provide a means for providing a readout of the calibration data. See fig. 4 and col. 11, ll. 4-15. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Jackson for the system of Patel, Bannister, Croset, and Mallebrein so that the measured numbers can be appropriately displayed for the calibration of the instrument.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1795
November 2, 2007


KAJ K. OLSEN
PRIMARY EXAMINER